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L2	3	(signomial and (exponent and coefficient))	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/05/23 12:31
L3	5	1 or 2	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/05/23 13:06
L4	105	((signomial posynomial)(geometric near4 (program$4 problem))).clm.	US-PGPUB	OR	OFF	2007/05/23 13:07
L5	10	4 and ((signomial posynomial) near8 (convert$4 expression form equation))	US-PGPUB	OR	OFF	2007/05/23 13:10
L6	1	5 and (exponent and coefficient). clm.	US-PGPUB	OR	OFF	2007/05/23 13:11

EAST Search History

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S38	10	(Geometric adj2 programming) and (@ad<="20000120" or @rlad<="20000120")	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/05/21 14:19
S40	0	(signomial same (exponent and coefficient and solver)).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/05/21 14:20
S41	0	(signomial same (exponent and coefficient)).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/05/21 14:20
S42	1	(posynomial and (exponent and coefficient)).clm.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/05/23 12:31
S43	2	"7162402".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/05/21 14:27

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1 Generalized Posynomial Performance Modeling ■
Tom Eeckelaert, Walter Daems, Georges Gielen, Willy Sansen
March 2003 **Proceedings of the conference on Design, Automation and Test in Europe - Volume 1 DATE '03**
Publisher: IEEE Computer Society
Full text available: 🔺 pdf(192.25 KB)
📲 Publisher Site

Additional Information: full citation, abstract, citings, index terms

This paper presents a new method to automatically generate posynomial symbolic expressions for the performance characteristics of analog integrated circuits. The coefficient set as well as the exponent set of the posynomial expression are determined based on SPICE simulation data with device-level accuracy. We will prove that this problem corresponds to solving a non-convex optimization problem without local minima. The presented method is capable of generating posynomial performance expressions ...

2 Session 1D: Analog macromodeling: Simulation-based automatic generation of signomial and posynomial performance models for analog integrated circuit sizing ■
Walter Daems, Georges Gielen, Willy Sansen
November 2001 **Proceedings of the 2001 IEEE/ACM international conference on Computer-aided design ICCAD '01**
Publisher: IEEE Press
Full text available: 🔺 pdf(163.89 KB)

Additional Information: full citation, abstract, references, citings, index terms

This paper presents a method to automatically generate posynomial response surface models for the performance parameters of analog integrated circuits. The posynomial models enable the use of efficient geometric programming techniques for circuit sizing and optimization. To avoid manual derivation of approximate symbolic equations and subsequent casting to posynomial format, techniques from design of experiments and response surface modeling in combination with SPICE simulations are used to gene ...

Keywords: analog circuit modeling, design of experiments, geometric programming, posynomial and signomial response surface modeling

3 Analog synthesis & design methodology: An efficient optimization--based technique ■
to generate posynomial performance models for analog integrated circuits

Walter Daems, Georges Gielen, Willy Sansen
June 2002 **Proceedings of the 39th conference on Design automation DAC '02**
Publisher: ACM Press

Full text available: pdf(113.85 KB)   Additional Information: full citation, abstract, references, citings, index terms

This paper presents an new direct--fitting method to generate posynomial response surface models with arbitrary constant exponents for linear and nonlinear performance parameters of analog integrated circuits. Posynomial models enable the use of efficient geometric programming techniques for circuit sizing and optimization. The automatic generation avoids the time--consuming nature and inaccuracies of handcrafted analytic model generation. The technique is based on the fitting of posynomial mode ...

Keywords: geometric programming, performance modeling for analog circuits, posynomial response surface modeling

4   Clustering 2: Power balanced coverage-time optimization for clustered wireless
sensor networks
Tao Shu, Marwan Krunz, Sarma Vrudhula
May 2005 **Proceedings of the 6th ACM international symposium on Mobile ad hoc
        networking and computing MobiHoc '05**
Publisher: ACM Press
Full text available: pdf(282.26 KB)   Additional Information: full citation, abstract, references, index terms

We consider a wireless sensor network in which sensors are grouped into clusters, each with its own cluster head (CH). Each CH collects data from sensors in its cluster and relays them to a sink node directly or through other CHs. The *coverage time* of the network is defined as the time until one of the CHs runs out of battery, resulting in an incomplete coverage of the sensing region. We study the maximization of coverage time by balancing the power consumption of different CHs. Using a R ...

Keywords: clustering, coverage time, generalized geometric programming, sensor networks, signomial optimization, topology control

5   A Fitting Approach to Generate Symbolic Expressions for Linear and Nonlinear
Analog Circuit Performance Characteristics
W. Daems, G. Gielen, W. Sansen
March 2002 **Proceedings of the conference on Design, automation and test in Europe
        DATE '02**
Publisher: IEEE Computer Society
Full text available: pdf(218.00 KB)   Additional Information: full citation, abstract, citings

This paper presents a novel method to automatically generate symbolicexpressions for both linear and nonlinear circuit characteristics using atemplate-based fitting of numerical, simulated data. The aim of the methodis to generate convex, interpretable expressions. The posynomiality of thegenerated expressions enables the use of efficient geometric programmingtechniques when using these expressions for circuit sizing and optimiza-tion.Attention is paid to estimating the relative 'goodness-of-fit ...

6   Computation: finite and infinite machines
Marvin L. Minsky
January 1967 Book

Publisher: Prentice-Hall, Inc.
Additional Information: full citation, abstract, references, citings, index terms

From the Preface (See Front Matter for full Preface)

Man has within a single generation found himself sharing the world with a strange new species: the computers and computer-like machines. Neither history, nor philosophy, nor common sense will tell us how these machines will affect us, for they do not do "work" as did machines of the Industrial Revolution. Instead of dealing with materials or energy, we are told that they handle "control" and "information" and even "intellectua ...

7 Advances in analog circuit and layout synthesis: Automated design of operational transconductance amplifiers using reversed geometric programming
Johan P. Vanderhaegen, Robert W. Brodersen
June 2004 **Proceedings of the 41st annual conference on Design automation DAC '04**
Publisher: ACM Press

Full text available: pdf(140.55 KB)   Additional Information: full citation, abstract, references, citings, index terms

We present a method for designing operational amplifiers using reversed geometric programming, which is an extension of geometric programming that allows both convex and non-convex constraints. Adding a limited set of non-convex constraints can improve the accuracy of convex equation-based optimization, without compromising global optimality. These constraints allow increased accuracy for critical modeling equations, such as the relationship between gm and IDS. To demons ...

Keywords: CMOS integrated circuits, operational transconductance amplifiers, reversed geometric programming

8 Cryptography and data security
Dorothy Elizabeth Robling Denning
January 1982 Book
Publisher: Addison-Wesley Longman Publishing Co., Inc.

Full text available: pdf(19.47 MB)   Additional Information: full citation, abstract, references, citings, index terms

From the Preface (See Front Matter for full Preface)

Electronic computers have evolved from exiguous experimental enterprises in the 1940s to prolific practical data processing systems in the 1980s. As we have come to rely on these systems to process and store data, we have also come to wonder about their ability to protect valuable data.

Data security is the science and study of methods of protecting data in computer and communication systems from unauthorized disclosure ...

9 Real-time shading
Marc Olano, Kurt Akeley, John C. Hart, Wolfgang Heidrich, Michael McCool, Jason L. Mitchell, Randi Rost
August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**
Publisher: ACM Press
Full text available: pdf(7.39 MB)   Additional Information: full citation, abstract

Real-time procedural shading was once seen as a distant dream. When the first version of this course was offered four years ago, real-time shading was possible, but only with one-of-a-kind hardware or by combining the effects of tens to hundreds of rendering passes. Today, almost every new computer comes with graphics hardware capable of interactively executing shaders of thousands to tens of thousands of instructions. This course has been

redesigned to address today's real-time shading capabili ...

10 Geometric programming: a programming approach to geometric design
Alberto Paoluzzi, Valerio Pascucci, Michele Vicentino
July 1995   **ACM Transactions on Graphics (TOG)**, Volume 14 Issue 3
Publisher: ACM Press

Full text available: pdf(2.54 MB)   Additional Information: full citation, abstract, references, citings, index terms

This article presents a functional programming approach to geometric design with embedded polyhedral complexes. Its main goals are to show the expressive power of the language as well as its usefulness for geometric design. The language, named PLASM (the Programming LAnguage for Solid Modeling), introduces a very high level approach to "constructive" or "generative" modeling. Geometrical objects are generated by evaluating some suitable language expressions. Because ...

Keywords: design language, functional programming, generative modeling, geometric design, polyhedra, solid modeling, variational geometry

11 Algorithm 719: Multiprecision translation and execution of FORTRAN programs
David H. Bailey
September 1993 **ACM Transactions on Mathematical Software (TOMS)**, Volume 19 Issue 3
Publisher: ACM Press

Full text available: pdf(2.03 MB)   Additional Information: full citation, appendices and supplements, abstract, references, cited by, index terms

This paper describes two Fortran utilities for multiprecision computation. The first is a package of Fortran subroutines that perform a variety of arithmetic operations and transcendental functions on floating point numbers of arbitrarily high precision. This package is in some cases over 200 times faster than that of certain other packages that have been developed for this purpose. The second utility is a translator program, which facilitates the conversion of ordinary Fortran p ...

Keywords: multiple-precision computation, multiprecision arithmetic

12 Algorithm 812: BPOLY: An object-oriented library of numerical algorithms for polynomials in Bernstein form
Yi-Feng Tsai, Rida T. Farouki
June 2001 **ACM Transactions on Mathematical Software (TOMS)**, Volume 27 Issue 2
Publisher: ACM Press

Full text available: pdf(185.42 KB)   Additional Information: full citation, appendices and supplements, abstract, references, cited by, index terms

The design, implementation, and testing of a C++ software library for univriate polynomials in Bernstein form is described. By invoking the class environment and operator overloading, each polynomial in an expression is interpreted as an object compatible with the arithmetic operations and other common functions (subdivision, degree, elevation, differentiation and integration, compoistion, greatest common divisor, real-root solving, etc.) for polynomials in Bernstein form. The library allow ...

Keywords: Bernstein bases, numerical stability, polynomial algorithms

13
Realistic materials in computer graphics: Realistic materials in computer graphics

Hendrik P. A. Lensch, Michael Goesele, Yung-Yu Chuang, Tim Hawkins, Steve Marschner,
Wojciech Matusik, Gero Mueller
July 2005 **ACM SIGGRAPH 2005 Courses SIGGRAPH '05**
Publisher: ACM Press
Full text available: pdf(18.24 MB)   Additional Information: full citation, references

14 Complexity and expressive power of logic programming
Evgeny Dantsin, Thomas Eiter, Georg Gottlob, Andrei Voronkov
September 2001 **ACM Computing Surveys (CSUR)**, Volume 33 Issue 3
Publisher: ACM Press
Full text available: pdf(552.99 KB)   Additional Information: full citation, abstract, references, citings, index terms

This article surveys various complexity and expressiveness results on different forms of
logic programming. The main focus is on decidable forms of logic programming, in
particular, propositional logic programming and datalog, but we also mention general logic
programming with function symbols. Next to classical results on plain logic programming
(pure Horn clause programs), more recent results on various important extensions of logic
programming are surveyed. These include logic programming wit ...

Keywords: Complexity, datalog, expressive power, logic programming, nonmonotonic
logic, query languages

15 Abstracts from symposium
November 1973 **ACM SIGMAP Bulletin**, Issue 15
Publisher: ACM Press
Full text available: pdf(4.17 MB)   Additional Information: full citation, abstract

Here follows many of the abstracts from the 8th International Mathematical Programming
Symposium. Each author was invited to update his abstract following his oral presentation
to include the latest ideas. The updated abstracts were used when available, otherwise the
original abstracts were used. Where an abstract was modified by the editor, an (M) is
included at the end. Where there are multiple authors to a paper, the one giving the paper
is underlined and the address refers to that author.

16 GPGPU: general purpose computation on graphics hardware
David Luebke, Mark Harris, Jens Krüger, Tim Purcell, Naga Govindaraju, Ian Buck, Cliff
Woolley, Aaron Lefohn
August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**
Publisher: ACM Press
Full text available: pdf(63.03 MB)   Additional Information: full citation, abstract, citings

The graphics processor (GPU) on today's commodity video cards has evolved into an
extremely powerful and flexible processor. The latest graphics architectures provide
tremendous memory bandwidth and computational horsepower, with fully programmable
vertex and pixel processing units that support vector operations up to full IEEE floating
point precision. High level languages have emerged for graphics hardware, making this
computational power accessible. Architecturally, GPUs are highly parallel s ...

17 Geometric range searching
Jiří Matoušek
December 1994 **ACM Computing Surveys (CSUR)**, Volume 26 Issue 4
Publisher: ACM Press

Full text available: pdf(3.92 MB)   Additional Information: full citation, abstract, references, citings, index terms, review

In geometric range searching, algorithmic problems of the following type are considered. Given an n-point set P in the plane, build a data structure so that, given a query triangle R, the number of points of P lying in R can be determined quickly. Similar questions can be asked for point sets in higher dimensions, with triangles replaced by simplices or by more complicated shapes. Algorithms of this type are of crucial importance in computational geometry, as they can be us ...

Keywords: computational geometry, lower bounds in arithmetic model, partition tree, range searching

18 A programming language

Kenneth E. Iverson
January 1962 Book
Publisher: John Wiley & Sons, Inc.

Full text available: pdf(40.45 MB)   Additional Information: full citation, abstract, references, citings, index terms

From the Preface

Applied mathematics is largely concerned with the design and analysis of explicit procedures for calculating the exact or approximate values of various functions. Such explicit procedures are called algorithms or programs. Because an effective notation for the description of programs exhibits considerable syntactic structure, it is called a programming language.

Much of applied mathematics, particularly the more recent computer-related areas which ...

19 PRECISE: efficient multiprecision evaluation of algebraic roots and predicates for reliable geometric computation

Shankar Krishnan, Mark Foskey, Tim Culver, John Keyser, Dinesh Manocha
June 2001 **Proceedings of the seventeenth annual symposium on Computational geometry SCG '01**
Publisher: ACM Press

Full text available: pdf(631.46 KB)   Additional Information: full citation, abstract, references, citings, index terms

Many geometric problems like generalized Voronoi diagrams, medial axis computations and boundary evaluation involve computation and manipulation of non-linear algebraic primitives like curves and surfaces. The algorithms designed for these problems make decisions based on signs of geometric predicates or on the roots of polynomials characterizing the problem. The reliability of the algorithm depends on the accurate evaluation of these signs and roots. In this paper, we present a {\em naive ...

20 A real-time procedural shading system for programmable graphics hardware

Kekoa Proudfoot, William R. Mark, Svetoslav Tzvetkov, Pat Hanrahan
August 2001 **Proceedings of the 28th annual conference on Computer graphics and interactive techniques SIGGRAPH '01**
Publisher: ACM Press

Full text available: pdf(1.20 MB)   Additional Information: full citation, abstract, references, citings, index terms, review

Real-time graphics hardware is becoming programmable, but this programmable hardware

is complex and difficult to use given current APIs. Higher-level abstractions would both increase programmer productivity and make programs more portable. However, it is challenging to raise the abstraction level while still providing high performance. We have developed a real-time procedural shading language system designed to achieve this goal.

Our system is organized around multiple *computation ...*

Keywords*: graphics hardware, graphics systems, rendering, shading languages*

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